



ORIGINAL ARTICLE

Development of Financial Support Program for High Risk Pregnant Women

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Abstract

Objectives: The purpose of this study was to develop a financial support program for high-risk pregnant women based on opinions obtained using a questionnaire survey.

Methods: The program development involved two steps: (1) developing a questionnaire through reviewing previous financial support programs for maternal care and then validating it via professional consultation; and (2) drafting a financial support program. Sixty professionals, 26 high-risk pregnant women, and 100 program implementers completed the questionnaire between August 2014 and October 2014.

Results: Based on the obtained professional consultation and survey investigation, the framework of the financial support program was constructed. The suggested recipients were mothers with early labor pains, mothers who have been hospitalized for > 3 weeks, and mothers who used uterine stimulant Pitocin during hospitalization. All hospitalization, medication, and examination costs needed to be supported considering the income level of the recipient.

Conclusion: A basic policy for financially supporting high-risk pregnant women has been developed. The efficacy and feasibility of the policy needs to be carefully examined in future studies.

1. Introduction

There is no consensus definition for a high-risk pregnancy, but this condition is normally defined as when the woman or fetus experiences a problem that requires medical treatment [1]. It has also been defined as the woman

experiencing at least one instance of a particular type of problem before, during, or after pregnancy [1]. A high-risk pregnancy increases the probability of death or disease infection in either the pregnant woman or fetus compared with a normal pregnancy, and may cause complications before, during, and after pregnancy [2]. Also, a high-risk

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pregnancy increases the probabilities of a premature birth and of a poor prognosis for the newborn baby [3].

The number of high-risk pregnancies is increasing in Korea, which is linked to the low birth rate and the steep increase in the average age of pregnancies. According to the National Statistics Office, the mean age of a mother when giving birth to her first child was 30.97 years in 2014, compared with 28.83 years in 2004 [4]. Meanwhile, mothers older than 35 years constituted 21.6% of pregnancies in 2014, compared with 9.4% in 2004. This phenomenon is linked to the mean age at marriage increasing from 26.49 years in 2000 to 29.59 years in 2013 [5].

Obstetric complications are increasing with the escalation of aged pregnancies. Older pregnant women have a higher illness rate related to obstetric complications such as gestational diabetes and hypertension, and illnesses related to the reproductive system such as uterine myoma [6–8]. This situation increases the risk of poor pregnancy outcomes such as giving birth to a premature or low-birth weight baby [9]. Illnesses such as edema before, during, and after childbirth, proteinuria and hypertensive disorder, and high-risk maternity management were more prevalent among mothers aged 30–34 years in 2010, and the prevalence was also increasing most rapidly in this age group [10]. The actual prevalence in the age group of 30–34 years was 6,141 (23%) in 2006, and had increased markedly to 10,649 (29%) in 2010 [10]. Therefore, both the absolute number and the proportion within this age group have increased.

Medical expenses are higher in high-risk pregnancies than in normal pregnancies due to the associated increased complications. Pregnancy expenses in the United States from 2000 to 2012 were mainly associated with issues related to high-risk pregnancies, such as hospitalization, childbirth problems, multifetal pregnancy, cesarean operation, high-risk childbirth, premature childbirth, low-birth weight infants, hypertension, diabetes, anemia, cancer, and *in vitro* fertilization. Expenses related to high-risk pregnancies generally represent a huge proportion of the total pregnancy expenses [11]. The mean estimated cost of a mother being hospitalized due to pregnancy in the United States was \$3,306 in 2008 and \$9,234 in 2012 [11]. However, for cases where complications occurred during pregnancy and the mothers had to deliver prematurely in the 25th week, the mean cost was \$326,953. The number of high-risk pregnant women in Korea is increasing, as are the related medical expenses. The number of cases of childbirth-related illness in high-risk pregnancies was 25,855 in 2006 and 53,507 in 2010; the total medical costs increased 2.1-fold over the same time period, from 2,700 million Korean won (KRW) in 2006 to 5,700 million KRW in 2010 [10].

The Korean government funds a financial support program aimed at reducing the burden of high medical expenses experienced by some pregnant women, which provides up to 500,000 KRW per pregnancy (up to

700,000 KRW for a multifetal pregnancy). This support fund can be used to pay medical costs due to bleeding, excessive nausea during pregnancy, early labor pains without signs of childbirth, and postnatal perspiration, but this fund is insufficient to cover all medical costs associated with high-risk pregnancies and childbirth. Some local governments are issuing coupons that can be used to pay for examinations of deformed children or are supporting medical costs in other ways, but this aid is limited to a specific year and lacks continuity [12]. Very few local governments are running aid systems, which means that on a nationwide basis there is essentially no support for high-risk pregnancies.

In order to support the costs associated with high-risk pregnant women maintaining their pregnancy and having a healthy childbirth, the government needs to implement active programs. This study provides details of a new suggested governmental program, named High-Risk Pregnant Women Aid Program (HRPWAP), in areas such as the support target, support period, means of support, support scope, submission of necessary documents, and support process.

2. Materials and methods

2.1. Study design and participants

This study was a survey-based investigation aimed at developing a financial support program for the HRPWAP. This was achieved by including professionals in this field, high-risk pregnant women, and program implementers as study participants who were selected by the study team using a convenience sampling method. The professionals comprised 17 obstetricians, 20 obstetrics nurses, and 10 professors in the field of Women's Health Nursing, and 13 professors in the field of Community Health Nursing. The number of high-risk pregnant women was 26 and the program implementers comprised eight heads of public health centers and 92 public servants in public health centers in charge of mother and child health. The total number of participants in this study was 186.

2.2. Study tool

The study tool was a structured self-report survey. No survey was available that was suitable for the purpose of this study, so the research team had to develop a new survey based on relevant data. From May 2014 to August 2014, the study team had consultation meetings with 15 advisory committee members while considering the development of a financial support program, comprising six public servants in public health centers in charge of mother and child health, one staff member of the Health Insurance Corporation, five nurses in the delivery room, one obstetrician, and two high-risk pregnant women. These consultations also considered programs related to the financial support program for

couples with infertility and medical expenses for pregnancy and low-weight childbirth. Such programs were similar to the financial support program being designed in this study, and the study team constructed a framework for the financial support program based on the obtained information. The specific issues addressed included the support target, support period, frequency of support, support standard for medical costs, support scope, supported contents, and means of support [13,14]. In each consultation meeting, the study team openly asked questions regarding the financial support program for HRPWAP and categorized the responses, which were used when developing questions for inclusion in the survey. Consultation meetings were carried out after asking the intention of the advisory panel to participate in the study, and by openly asking questions during personal visits. The study team asked permission from the members of the advisory panel and recorded the contents of the meetings. After completing each consultation meeting, we transcribed the recorded contents onto paper and organized the summary of the contents following the framework of a financial support program. The draft survey questions were developed by two members of the study team. In order to improve the validity of the survey questions, the study team individually interviewed 15 people, comprising one obstetrician, five obstetrics nurses, six public servants in public health centers in charge of mothers, one staff member of the Health Insurance Corporation, and two high-risk pregnant women, and then revised and supplemented the answers related to each survey question.

The final determined survey was categorized into surveys for professionals, high-risk pregnant women, and program implementers. The surveys for professionals and program implementers included several questions related to the financial support program, and regular characteristics such as sex, age, profession, and work experience. The survey for high-risk pregnant women included eight questions related to the financial support program, and regular characteristics such as age, high-risk form of pregnancy, status of the multifetal pregnancy, and gestation period.

2.3. Method of data collection

Before progressing with our study, the study team received ethical approval from the Institutional Review Board at Eulji University, Daejeon, Korea (approval number: EU 14-15). The participants to be included in the survey investigation were selected with a convenience sampling method. The study team selected potential participants and sent them an e-mail message or telephoned them and explained the purpose of the study and the structure of the survey, and then asked for their consent to send them the survey questionnaire. Also, in the case of high-risk pregnant women, the study team asked for assistance from selected obstetricians and obstetrics nurses, and distributed the survey only to

high-risk pregnant women hospitalized in the delivery room who agreed to participate in this study. The surveys were distributed by e-mail or postal mail, and completed surveys were returned via e-mail or postal mail in a supplied return envelope. The data were collected in a 3-month period from August 2014 to October 2014. The study team offered a small payment to participants who completed and returned the survey.

2.4. Statistical analysis

SPSS software (version 18.0; SPSS Inc., Chicago, IL, USA) was used to analyze the collected data, such as for calculating percentage, frequency, mean, and standard deviation values.

3. Results

3.1. General characteristics of the study participants

The characteristics of the study participants are listed in Table 1. The mean length of work experience of the 60 professionals included in the study was 11.3 years. The mean age of the 26 high-risk pregnant women was 35.0 years. Most of the women ($n = 15$) had previous experience of pregnancy. The most common reason for a high-risk pregnancy was early labor pains ($n = 18$ women), followed by age ($n = 13$) and early membrane rupture ($n = 6$). Most of the pregnancies were singleton (76.9%), and the mean gestation age was 29.2 weeks. The mean age of the 100 program implementers was 41.0 years, and their mean length of work experience in the field was 2.3 years.

3.2. Survey opinions related to the a financial support program

The results obtained in the analysis of the participants' opinions related to the financial support program are given in Table 2. The study team allowed recipients of the aid program to provide multiple answers; the recipients with the most responses were pregnant women with early labor pains (31.2%), followed by pregnant women with gestational hypertension (29.6%). In the case of professionals, their most frequent choice was pregnant women with early labor pains (48.3%) and pregnant women with early membrane rupture (36.7%). In the case of high-risk pregnant women, their most frequent choice was pregnant women with early labor pains (65.4%) and pregnant women with early membrane rupture (46.2%). In the case of program implementers, their most frequent choice was pregnant women with gestational hypertension (32.0%) and gestational diabetes (29.0%).

Regarding the period of support, the participants preferred aid after the pregnancy diagnosis (65.1%). Overall the professionals preferred aid after the pregnancy diagnosis (66.7%), whereas nurses preferred aid

Table 1. General characteristics of the study participants.

Variable	Category	<i>n</i>	%
Professionals			
Sex	Male	7	11.7
	Female	53	88.3
Age (y)	Mean \pm SD	42.8 \pm 8.1	
Occupation	Obstetrician	17	28.3
	Obstetrics nurse	20	33.3
	Nursing professor	23	48.4
Work experience (y)	Mean \pm SD	11.3 \pm 6.8	
High-risk pregnant women			
Age (y)	Mean \pm SD	35.0 \pm 4.4	
Previous pregnancy	Yes	15	57.7
	No	11	42.3
Type of high-risk pregnancy	Preterm labor	18	69.2
	Premature membrane rupture	6	23.1
	Abruptio placentae	2	7.7
	Placenta previa	4	15.4
	High blood sugar during pregnancy	3	11.5
	Hypertension during pregnancy	2	7.7
	Older pregnancy	13	50.0
	Other	9	34.6
Pregnancy type	Singleton pregnancy	20	76.9
	Multifetal pregnancy	6	23.1
Gestational age (wk)	Mean \pm SD	29.2 \pm 6.8	
Program implementers			
Sex	Male	4	4.0
	Female	96	96.0
Age (y)	Mean \pm SD	41.0 \pm 9.6	
Occupation	Head of public health center	8	8.0
	Public servant in public health center	92	92.0
Geographic area	Daegu	3	3.0
	Daejeon	2	2.0
	Ulsan	5	5.0
	Gwangju	5	5.0
	Gyeonggi	21	21.0
	Chungcheong	18	18.0
	Jeolla	23	23.0
	Gyeongsang	20	20.0
	Sejong	1	1.0
	No answer	2	2.0
Work experience (y)	Mean \pm SD	2.3 \pm 3.8	

SD = standard deviation.

after childbirth. Most of the high-risk mothers (88.5%) and 58.0% of the program implementers preferred aid after the pregnancy diagnosis.

Regarding the frequency of support, the participants preferred once per pregnancy (76.9%), as did all of the other respondents.

For devising an aid standard for the category of medical costs, the participants generally preferred support for payments of total charged amounts and other nonpayments (41.9%), but professionals and high-risk mothers specifically preferred support for total charged amounts and other nonpayments, which differed from the opinion of the program implementers.

The study team divided the category of support scope into hospitalization, medication, and examination costs, and then conducted the survey. There was a high demand for supporting examination costs, and examination costs were preferred (41.4%) for essential support. The professionals mostly preferred support for examination costs, and strongly preferred support for examination costs for essential support (53.3%), whereas doctors preferred support for medication costs. The program implementers responded with equal levels of support for hospitalization, medication, and examination costs, and strongly preferred examination costs (41.0%) as essential support. When choosing between support

Table 2. Participants' opinions related to the financial support program.

Content	Category	Professionals (n = 60)	High-risk pregnant women (n = 26)	Program implementers (n = 100)
Target women*	Preterm labor	29 (48.3)	17 (65.4)	12 (12.0)
	Premature membrane rupture	22 (36.7)	12 (46.2)	19 (19.0)
	Hypertension	19 (31.7)	4 (15.4)	32 (32.0)
	Hemorrhagic pregnancy	9 (15.0)	3 (11.5)	13 (13.0)
	Older pregnancy	9 (15.0)	5 (19.2)	20 (20.0)
	Multifetal pregnancy	16 (26.7)	6 (23.1)	24 (24.0)
	High blood sugar	4 (6.7)	1 (3.8)	29 (29.0)
	Cardiovascular diseases	9 (15.0)	0 (0.0)	18 (18.0)
	Pulmonary diseases	0 (0.0)	0 (0.0)	3 (3.0)
	Hematological diseases	2 (3.3)	0 (0.0)	16 (16.0)
	Infectious diseases	3 (5.0)	0 (0.0)	10 (10.0)
	Other	3 (5.0)	1 (3.8)	5 (5.0)
Time	At the time of the pregnancy diagnosis	40 (66.7)	23 (88.5)	58 (58.0)
	After delivery	20 (33.3)	3 (11.5)	42 (42.0)
Frequency	Once per person	8 (13.3)	4 (15.4)	31 (31.0)
	Once per pregnancy	52 (86.7)	22 (84.6)	69 (69.0)
Type	Benefit (total out-of-pocket cost) + uninsured benefit	23 (38.3)	13 (50.0)	27 (27.0)
	Benefit (whole cost out-of-pocket cost) + uninsured benefit	20 (33.3)	10 (38.5)	48 (48.0)
	Uninsured benefit	17 (28.3)	3 (11.5)	25 (25.0)
Scope*	Hospitalization costs	47 (78.3)	21 (80.8)	73 (73.0)
	Medication costs	44 (73.3)	19 (73.1)	61 (61.0)
Scope (mandatory)	Examination costs	51 (85.0)	22 (84.6)	75 (75.0)
	Hospitalization costs	11 (18.3)	9 (34.6)	41 (41.0)
	Medication costs	17 (28.3)	11 (42.3)	20 (20.0)
Content	Examination costs	32 (53.3)	6 (23.1)	39 (39.0)
	Cash	21 (35.0)	13 (50.0)	42 (42.0)
Support policy	Benefit	39 (65.0)	13 (50.0)	58 (58.0)
	Same cost for every beneficiary	2 (3.3)	5 (19.2)	17 (17.0)
	Support varies with out-of-pocket cost	28 (46.7)	13 (50.0)	49 (49.0)
	Percentage payment according to out-of-pocket cost	19 (31.7)	3 (11.5)	18 (18.0)
	Minimum payment of out-of-pocket cost	4 (6.7)	3 (11.5)	10 (10.0)
	Minimum payment varies with out-of-pocket cost	3 (5.0)	2 (7.7)	6 (6.0)
	Conditional payment of out-of-pocket cost	4 (6.7)	0 (0.0)	0 (0.0)

*Multiple answers possible.

provided by goods or cash, the participants generally preferred goods (59.1%), but high-risk mothers preferred cash.

In order to identify a practical way for reducing the economic burden of the program recipients by following their situation and minimizing ethical laxity, the study team proposed six different means of support. The results showed that participants preferred that the amount of support was graduated according to the burden, while imposing an upper limit (48.4%) on the amount. This preference was the same for all respondents regardless of their classification.

3.3. Proposed financial support program

Based on the obtained information, professional consultations, and survey investigation, the study team devised a financial support program as given in [Table 3](#). The recipients were mothers with early labor pains, mothers who have been hospitalized for > 3 weeks, mothers who had a gestational period of 23–31 weeks during the period of hospitalization, mothers who used uterine stimulant Pitocin during hospitalization, and mothers with an income of < 150% of the national average. The study team suggested that the support period should be within 6 months after childbirth, and that

Table 3. Suggested program settings.

	Program setting
Target women	Preterm labor Admitted > 3 wk during pregnancy previously Gestational period of 23–31 wk Admitted pregnant women using uterus constrictors Low household income of < 150% of the average income
Time	After delivery (not more than 6 mo after delivery)
Frequency	Once per pregnancy
Scope	Hospitalization, medication, and examination costs
Content	Benefit
Support policy	Support varies with out-of-pocket cost, with an upper limit
Institution in charge	Public health center

support should be provided only once per pregnancy. The scope of support should include all hospitalization, medication, and examination costs. The study team chose to follow the principle of a graduated amount of support with an upper limit. For assigning a responsible administration, public administration such as by a public health center should be appropriate in order to facilitate the acquisition of data on the level of income in order to allow identification of the low-income group.

4. Discussion

This study was conducted as a policy-making research for developing a financial support program for the HRPWAP implemented by the Ministry of Health and Welfare with the aim of reducing the burden of medical costs for high-risk pregnant women. In association with a financial support program, the study team performed a survey investigation involving obstetricians, obstetrics nurses, and relevant professors in the school of nursing, high-risk pregnant women, and program implementers such as heads of public health centers and public servants in public health centers in charge of mother and child health. A financial support program devised including the support target, support period, and the frequency of support.

The results from the survey investigation showed a high frequency of responses regarding the need to support mothers with early labor pains, early membrane rupture, gestational hypertension, bleeding during childbirth, multifetal pregnancy, and gestational hypertension. Although not presented in this survey investigation, there was a proposal to classify recipients for support into a high-risk group (early labor pains, early membrane rupture, bleeding during childbirth, and multifetal pregnancy), a group with pregnancy accompanied by illness (gestational hypertension, diabetes, respiratory illness, hematologic illness, and contagious illness), and a potential high-risk group (aged

participants), with the form of support differing among these groups. Another proposal was that the program should target low-income groups that have the highest economic burden, but should expand the definition of “low income” to support the majority of people. A process of drawing up a social agreement within the budget may be necessary to support this, and the study team assumes that a process involving listening to the opinions of various interested parties through public hearings may also be needed. In selecting the support target, the study team believes that it will be important to select recipients who incur additional medical expenses due to high-risk pregnancy, recipients who need practical aid due to large medical expenses and recipients with the lowest ethical laxity. Based on such standards, the study team considered mothers with early labor pains, mothers who have been hospitalized for more than 3 weeks, mothers with a gestational period of 23–31 weeks, mothers who used the uterine stimulant Pitocin during hospitalization, and mothers with an income of < 150% of the national average. Mothers with a gestational period of 23–31 weeks at the time of hospitalization were considered because: (1) hospitalization, medication, and examination costs are higher for a younger gestational age; and (2) a mother with a gestational period of 31 weeks and who has been hospitalized for > 3 weeks may continue her pregnancy until the 34th week in order to maintain her physiological stability after childbirth. For example, if a mother enters the hospital in the 32nd week, the study team anticipates that she will stay in the hospital for 2 weeks (i.e., until the 34th week). In such cases the medical expenses may be low, and so the study team considers it better for these mothers to be excluded from the support target.

The most responses related to the support period expressed support for considering the time since the pregnancy diagnosis. While this can reduce the economic burden of high-risk pregnant women and increase their desire to maintain their pregnancy, there is a high

probability of ethical laxity also developing. Therefore, it is necessary to specify the time period during which support can be applied. The study team proposes support should only be provided to high-risk pregnant women within 6 months after pregnancy.

Relevant to the support standard for medical expenses, there were many ideas related to the plan for both supporting payments of total charged amounts and other nonpayment. It is possible that overlapping support will be provided by private health insurances, and the study team assumes that only supporting other nonpayment is advisable. In particular, in the case of supporting examination costs, excluding common examinations and restricting support to high-risk pregnancies might be more appropriate for the purpose of the program.

Regarding the frequency of support, the survey results showed a preference for pregnant women being supported only once per pregnancy. Considering the low birth rate and the associated desirability of encouraging pregnancy, the study team considers it appropriate to support each pregnancy that meets the aid standards.

Regarding the support scope, there was a high demand for supporting examination costs. High-risk pregnant women are associated with regular and frequent observation of changes in the health conditions of both mother and child, which increases the number of examinations and hence also examination costs, making it appropriate to support examination costs. However, the survey investigation elicited many statements that pregnant women with early labor pains carry a higher burden of medication costs than of examination costs, specifically due to the nonpaid use of Tractocile for pregnancies with preterm uterine contraction. In particular, in the case of pregnant women with early labor pains and gestational hypertension who require long-term hospitalization, the study team recommends that aid should include the hospital, medication, and examination costs incurred during the period of hospitalization from a high-risk pregnancy diagnosis until childbirth.

Most responses related to the means of support indicated a preference for the amount of support to be graduated according to the amount of burden but also with an upper limit. Considering that the purpose of the program is to reduce the economic burden experienced by high-risk pregnant women, graduating the amount of support is appropriate, while the upper limit could be determined based on the entire program budget through consultation meetings and public hearings.

While older mothers are associated with a higher probability of high-risk pregnancy, if such mothers receive good healthcare they can still deliver healthy children [15,16], and so the study team considers that the recipient's age should not be considered in the HRPWAP. Instead, like for all pregnancies, there is a need to reinforce not only an economic support program

for medical costs but also for prenatal education, and it is necessary to include a detailed education program that follows the pregnancy period in the supporting policy [9,17].

Low-income recipients must be considered a priority group, and to ensure the acquisition of sufficient relevant data, the study team suggests that this should be the responsibility of public health centers. However, it is necessary for the supporting policy to expand in order for health insurance to gradually broaden in order to overcome low birthrates and promote the concept of motherhood [11]. Also, the survey investigation of this study aimed to develop a financial support program, but we believe that additional measures are needed to ensure that pregnant women deliver healthy babies, such as consultation services for healthcare during pregnancy and emotional support [18,19]. In addition, interventions that include prenatal home visitations and prenatal-care groups for high-risk pregnancies would be particularly effective among low-income women [20]. Also, a study evaluating the intervention program needs to be performed after the policy has been implemented [21].

The present study investigated ways to develop a financial support program regarding the HRPWAP carried forward by the government. The main merit of this study is developing a financial support program based on the opinions obtained from all relevant stakeholders using a questionnaire survey. In the future, based on the outcomes from the survey investigation, the study team proposes initiating public hearings in order to draw up a social agreement and identify the best financial support program for implementation.

It is necessary to develop a concrete health education service related to the process of pregnancy and to support mediation counseling. The study team also considers that there is a need to establish an education policy for women of childbearing age to ensure that they have basic knowledge about pregnancy and childbirth. Moreover, in order to improve the awareness of healthy relationships and sex, it will be necessary to develop sex education programs for adolescents and young adults.

Conflicts of interest

None.

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References

1. Zadeh MA, Khajehei M, Sharif F, et al. High-risk pregnancy: effects on postpartum depression and anxiety. *Br J Midwifery* 2012 Apr;20(2):104–13.

2. Lim JS. A study for care center for high risk pregnant women and new born baby. Seoul: Institute of Health; 2010. 117 p.
3. Korean Society of Maternal Fetal Medicine. The Survey on the actual conditions of delivery room and delivery of high-risk pregnancy. Seoul: Ministry of Health; 2012. 166 p.
4. Statistics Korea. 2015 Birth and death statistics. Seoul: Statistics Korea. 2015 [Internet]. Available from: http://www.kostat.go.kr/portal/korea/kor_ko/5/2/index.board?bmode=read&aSeq=334108 [accessed 01.04.15].
5. Statistics Korea. 2014 Social indicators in Korea. Seoul: Statistics Korea. 2014 [Internet]. Available from: http://www.kostat.go.kr/portal/korea/kor_nw/3/index.board?bmode=read&aSeq=334502 [accessed 03.04.15].
6. Franz MB, Husslein PW. Obstetrical management of the older gravida. *Womens Health* 2010 May;6(3):463–8.
7. Jacobsson B, Ladfors L, Milsom I. Advanced maternal age and adverse perinatal outcome. *Obstet Gynecol* 2004 Oct;104(4):727–33.
8. Seoud MA, Nassar AH, Usta IM, et al. Impact of advanced maternal age on pregnancy outcome. *Am J Perinatol* 2002 Jan;19(1):1–8.
9. Kim DS, Kim YT, Kim TH. Maternal age and adverse pregnancy outcomes in Korea: A comprehensive approach to prenatal care. Seoul: Korean Women's Development Institute; 2011. 351 p.
10. Sin HC. Analysis of treatment trend of high risk pregnancy. Seoul: Health Insurance Review and Assessment Service Policy Trend; 2012. p. 351–360 p.
11. Huynh L, McCoy M, Law A, et al. Systematic literature review of the costs of pregnancy in the US. *Pharmacoeconomics* 2013 Nov;31(11):1005–30.
12. Lee SY, Im JY. Improving the population quality in low fertility and aging Korea: Policy challenges for birth outcomes for women of advanced maternal age. Seoul: Korea Institute for Health and Social Affairs; 2013. 220 p.
13. Ministry of Health and Welfare. Women and children focused information of integrated health promotion program. Seoul: Ministry of Health and Welfare. 2014 [Internet]. Available from: http://www.129.go.kr/info/info04_view.jsp?n=83 [accessed 15.04.01].
14. Ministry of Health and Welfare. General information of integrated health promotion program, Seoul: Ministry of Health and Welfare. 2014 [Internet]. Available from: http://download.mw.go.kr/front_new/modules/download.jsp?BOARD_ID=1003&CONT_SEQ=298108&FILE_SEQ=147179 [accessed 15.04.01].
15. Kim TE, Lee SP, Park JM, et al. The effects of maternal age on outcome of pregnancy in healthy elderly primipara. *Korean J Perinatol* 2009 Jun;20(2):146–52.
16. Kim MJ. Nutritional status, eating habit, knowledge level and obstetric outcome in pregnant women with old age [master's thesis]. Seoul: Hanyang University; 2014. 47 p.
17. Wang HJ, Park HS, Kim IO. Comparison of prenatal health management state and educational needs for pregnant women with advanced maternal age and under the age of 35. *Korean J Women Health Nurs* 2013 Dec;19(4):230–41.
18. Hodnett ED, Fredericks S, Weston J. Support during pregnancy for women at increased risk of low birthweight babies. *Cochrane Database Syst Rev* 2010 Jun;16(6):1–41.
19. Eslami M, Yazdanpanah M, Taheripana R, et al. Importance of pre-pregnancy counseling in Iran: results from the high risk pregnancy survey 2012. *Int J Health Policy Manag* 2013 Sep;1(3):213–8.
20. Krans EE, Davis MM. Strong start for mothers and newborns: implications for prenatal care delivery. *Curr Opin Obstet Gynecol* 2014 Dec;26(6):511–5.
21. Roman L, Raffo JE, Zhu Q, et al. A statewide Medicaid enhanced prenatal care program: impact on birth outcomes. *JAMA Pediatr* 2014 Mar;168(3):220–7.